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APPLICATION NO.	FILI	NG DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/029,608	3 05/15/1998		NORIO FUKASAWA	980233	6285
38834	7590	12/03/2004		EXAN	INER
	•	TORI, DANIEL	GRAYBILI	GRAYBILL, DAVID E	
1250 CONNE SUITE 700	ECTICUT A	AVENUE, NW	ART UNIT	PAPER NUMBER	
WASHINGT	ON, DC	20036		2822	<del></del>

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)					
	09/029,608	FUKASAWA ET AL.					
Office Action Summary	Examiner	Art Unit					
	David E Graybill	2822					
The MAILING DATE of this communication app Period for Reply	pears on the cover sheet with the c	orrespondence address					
A SHORTENED STATUTORY PERIOD FOR REPL' THE MAILING DATE OF THIS COMMUNICATION.  - Extensions of time may be available under the provisions of 37 CFR 1.1 after SIX (6) MONTHS from the mailing date of this communication.  - If the period for reply specified above is less than thirty (30) days, a repl - If NO period for reply is specified above, the maximum statutory period - Failure to reply within the set or extended period for reply will, by statute Any reply received by the Office later than three months after the mailing earned patent term adjustment. See 37 CFR 1.704(b).	36(a). In no event, however, may a reply be timey within the statutory minimum of thirty (30) day will apply and will expire SIX (6) MONTHS from , cause the application to become ABANDONE	nely filed s will be considered timely. the mailing date of this communication. D (35 U.S.C. § 133).					
Status	•						
1) Responsive to communication(s) filed on 14 S	entember 2004						
· · · · · · · · · · · · · · · · · · ·	action is non-final.						
3) Since this application is in condition for allowa		secution as to the merits is					
	closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213.						
Disposition of Claims							
·	21 and 122 is/are pending in the	application					
	Claim(s) 109,111,115,116,119,120,127,129-131 and 133 is/are pending in the application.  4a) Of the above claim(s) is/are withdrawn from consideration.						
_	☐ Claim(s) is/are allowed. ☐ Claim(s) 109,111,115,116,119,120,127,129-131 and 133 is/are rejected. ☐ Claim(s) is/are objected to.						
Application Papers							
9) The specification is objected to by the Examine	ır						
10)☐ The drawing(s) filed on is/are: a)☐ accepted or b)☐ objected to by the Examiner.							
Applicant may not request that any objection to the							
	Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).						
	1) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.						
Priority under 35 U.S.C. § 119							
12)☐ Acknowledgment is made of a claim for foreign	nriority under 25 H C C \$ 110(a)	\ (d\ or (f)					
a) All b) Some * c) None of:	priority under 35 0.5.C. § 119(a)	)-(d) 01 (1).					
2. Certified copies of the priority document		on No					
3. Copies of the certified copies of the prior							
application from the International Bureau		The same state of the same sta					
* See the attached detailed Office action for a list		ed.					
Attachment(s)							
1) Notice of References Cited (PTO-892)	4) Interview Summary						
2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)	Paper No(s)/Mail Da 5) Notice of Informal P	ate atent Application (PTO-152)					
Paper No(s)/Mail Date	6) Other:						

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8-12-4 has been entered.

In the request for continued examination applicant instructs, "Consider the arguments in the Appeal Brief or Rely Brief previously filed on August 12, 2004." However, there is no such submission in the record.

Claim 129 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Specifically, it is inherent in claim 127 that a side surface of the resin layer and a side surface of the semiconductor device are flush with each other because the side surface of the resin layer is a side surface of the semiconductor device, and the side surface of the resin layer is flush with itself.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claim 133 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 133 is incomplete because it depends on canceled claim 132. See MPEP 608.01(n)V.

In the rejections infra, generally, reference labels are recited only for the first recitation of identical claim elements.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 109, 111, 127 and 129-131 are rejected under 35 U.S.C. 102(e) as being anticipated by Yasunaga (5656863).

At column 1, line 1 to column 2, line 5; column 2, lines 37-57; column 3, lines 7-47; column 16, line 16 to column 18, line 12; and column 25, lines 44-47, Yasunaga discloses the following:

A semiconductor device comprising: a semiconductor element 113 having a surface on which protruding electrodes 112 are formed; a compression-molded (transfer molded) resin layer 111 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof, said end portions protruding a height from the resin layer; and external connection protruding electrodes 53b provided to the end portions of the protruding electrodes that protrude from the resin layer, said external connection protruding electrodes forming a bump, said bump having a height larger than said height of said protruding electrode protruding beyond said resin layer, wherein both a side portion of the resin layer and a side portion of the semiconductor element are respectively exposed at least to each other.

A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes having convex end portions are formed; a compression-molded resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except the

convex end portions thereof, said convex end portions protruding a height from the resin layer; and external connection protruding electrodes provided to the convex end portions of the protruding electrodes that protrude from the resin layer, said external connection protruding electrodes forming a bump, said bump having a height larger than said height of said protruding electrode protruding beyond said resin layer, wherein both a side portion of the resin layer and a side portion of the semiconductor element are respectively exposed at least to each other.

A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes are formed; and a compression-molded resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof, wherein the compression-molded resin layer and the semiconductor element have surfaces; wherein a side surface of the resin layer (the side directly abutting the semiconductor element) and a side surface of the semiconductor device (the side directly abutting the resin layer) are flush with each other; wherein end portions of the protruding electrodes protrude from the compression-molded resin layer.

A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes are formed; a compression-molded resin layer formed on the surface of the semiconductor element so as to seal

the protruding electrodes except end portions thereof; and external connection protruding electrodes provided to the end portions of the protruding electrodes that protrude from the compression-molded resin layer, the compression-molded resin layer and the semiconductor element having surfaces.

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Although Yasunaga does not appear to literally disclose a compression-molded resin layer, Yasunaga discloses a transfer molded resin layer.

Moreover, as admitted by applicant in the declaration filed on 8-12-4, a transfer molded resin layer is a compression-molded resin layer. In any case, the product of Yasunaga inherently possesses the structural characteristics imparted by the process limitation, "compression-molded."

See In re Fitzgerald, Sanders, and Bagheri, 205 USPQ 594 (CCPA 1980).

Also, although Yasunaga does not appear to explicitly disclose the surfaces defined by cutting using a dicer, the product of Yasunaga inherently possesses the structural characteristics imparted by this process limitation. See In re Fitzgerald, Sanders, and Bagheri, 205 USPQ 594 (CCPA 1980).

Claims 109, 111, 127 and 129-131 are rejected under 35
U.S.C. 103(a) as being unpatentable over Yasunaga as applied to claims
109, 111, 127 and 129-131 supra, and further in combination with Kitaura (4956132).

Although Yasunaga does not appear to literally disclose that the molded resin layer is compression-molded, as cited, Yasunaga discloses a transfer/injection molded resin layer. Furthermore, at column 1, lines 26-34, Kitaura discloses that transfer/injection molding and compression molding processes are alternatives and equivalents; therefore, it would have been obvious to substitute or combine the compression molding process of Kitaura for or with the transfer/injection molding process of Yasunaga. See In re May (CCPA) 136 USPQ 208 (It is our opinion that the substitution of Wille's type seal for the cement of Hallauer in Figure 1 would be obvious to persons of ordinary skill in the art from the disclosures of these references, merely involving an obvious selection between known alternatives in the art and the application of routine technical skills.); In re Cornish (CCPA) 125 USPQ 413; In re Soucy (CCPA) 153 USPQ 816; Sabel et al. v. The Wickes Corporation et al. (DC SC) 175 USPQ 3; Ex parte Seiko Koko Kabushiki Kaisha Co. (BdPatApp&Int) 225 USPQ 1260; and Ex parte Rachlin (BdPatApp&Int) 151 USPQ 56. See also Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980) (However, there was evidence that both phthalocyanine and selenium were known photoconductors in the art of electrophotography. "This, in our view, presents strong evidence of obviousness in substituting one for the other in an electrophotographic environment as a photoconductor." 209 USPQ at 759.). An express

suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). "It is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted). See also In re Crockett, 279 F.2d 274, 126 USPQ 186 (CCPA 1960); Ex parte Quadranti, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992).

Claims 115, 116, 119 and 120 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Yasunaga (5656863) and Nolan (5508228).

At column 29, line 32 to column 30, line 47, Yasunaga discloses the following:

A semiconductor device comprising: a semiconductor element 3 having a surface on which electrode pads 4 connected to an internal part of the semiconductor element and protruding electrodes 60 to be connected to an external part are formed; lead lines 61 each connecting one of the electrode pads and one of the protruding electrodes so that the protruding electrodes and the internal pad are connected through the lead lines; and a resin layer

1 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof, the protruding electrodes inherently having a core portion (the core of the innermost layer of the "multilayer structure") and an electrically conductive film (the outermost layer of the "multilayer structure") formed on a surface of the core portion, the core portions of the protruding electrodes are directly formed on the lead lines, said end portions are covered with said electrically conductive film.

A semiconductor device comprising: a semiconductor element having a surface on which electrode pads connected to an internal part of the semiconductor element and protruding electrodes to be connected to an external part are formed; lead lines each connecting one of the electrode pads and one of the protruding electrodes so that the protruding electrodes and the internal part are connected through the lead lines; and an insulating layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; and external connection protruding electrodes (the outermost layer of the "multilayer structure") provided to the end portions of the protruding electrodes that protrude from the resin layer, the protruding electrodes inherently having a core portion and an electrically conductive film formed on a surface of the core portion, the core portions of the protruding electrodes are directly formed on the lead

lines, and said end portions are covered with said electrically conductive film.

To further clarify the disclosure that the electrode pads are connected to an internal part of the semiconductor element and the protruding electrodes and the internal part are connected through the lead lines, it is noted that it is inherent that the semiconductor element comprises an internal part, and the pads, internal part, protruding electrodes, and lead lines are at least physically connected to each other.

However, Yasunaga does not appear to explicitly disclose wherein the core portion comprises an elastic resin, a part of said protruding electrode sealed by said resin layer and said end portions are covered commonly with said electrically conductive film; wherein the elastic resin is polyimide.

Nonetheless, at column 8, line 44 to column 10, line 58; and column 11, line 47 to column 13, line 28, Nolan discloses wherein the protruding electrode 10 core portion 24 comprises an elastic resin, a part of the protruding electrode and end portions are covered commonly with an electrically conductive film 62; wherein the elastic resin is polyimide.

Moreover, it would have been obvious to combine this disclosure of Nolan with the disclosure of Yasunaga because it would facilitate provision of the electrode of Yasunaga and improve device bonding.

Claims 109, 111, 127 and 129-131 are rejected under 35 U.S.C. 102(b) as being anticipated by Brooks (5824569).

At column 1, lines 20-24, column 2, line 29 to column 4, line 61, and column 5, lines 14-22, Brooks discloses the following:

A semiconductor device comprising: a semiconductor element 104 having a surface on which protruding electrodes 100 are formed; a molded resin layer 110 formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions 100 thereof, said end portions inherently protruding a height from the resin layer; and external connection protruding electrodes 100 provided to the end portions of the protruding electrodes that protrude from the resin layer, said external connection protruding electrodes forming a bump, said bump having a height larger than said height of said protruding electrode protruding beyond said resin layer, wherein both a side portion of the resin layer and a side portion of the semiconductor element are respectively exposed (after dicing).

A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes having convex end portions (balls) are formed; a resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except the convex end portions thereof, said convex end portions protruding a height from the resin

layer; and external connection protruding electrodes provided to the convex end portions of the protruding electrodes that protrude from the resin layer, said external connection protruding electrodes forming a bump, said bump having a height larger than said height of said protruding electrode protruding beyond said resin layer, wherein both a side portion of the resin layer and a side portion of the semiconductor element are respectively exposed.

A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes are formed; and a molded resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof, wherein the molded resin layer and the semiconductor element have defined by cutting using a dicer "segmented by using a saw blade"; wherein a side surface of the resin layer and a side surface of the semiconductor device are flush with each other (after dicing); wherein end portions of the protruding electrodes protrude from the molded resin layer.

A semiconductor device comprising: a semiconductor element having a surface on which protruding electrodes are formed; a molded resin layer formed on the surface of the semiconductor element so as to seal the protruding electrodes except end portions thereof; and external connection protruding electrodes provided to the end portions of the protruding

electrodes that protrude from the molded resin layer, the molded resin layer and the semiconductor element having surfaces defined by cutting using a dicer.

To further clarify, Figures 4-6 illustrate end portions 100 inherently protruding a height from the resin layer, and external connection protruding electrodes 100 provided to the end portions of the protruding electrodes that protrude from the resin layer. In addition, as cited, Brooks discloses that, "the encapsulation leaves at least a portion of one ball exposed"; therefore, Brooks inherently discloses more than one ball protruding a height from the resin layer, including one ball and a portion of another ball protruding a height from the resin layer.

Although Brooks does not appear to explicitly disclose that the molded resin layer is a compression-molded layer, the product of Brooks inherently possesses the structural characteristics imparted by this process limitation. See In re Fitzgerald, Sanders, and Bagheri, 205 USPQ 594 (CCPA 1980).

Claims 109, 111, 127 and 129-131 are rejected under 35
U.S.C. 103(a) as being unpatentable over Brooks as applied to claims 109, 111, 127 and 129-131 supra, and further in combination with Kitaura (4956132).

Although Brooks does not appear to explicitly disclose that the molded resin layer is compression-molded, as cited, Brooks discloses that the

molded resin layer is molded by casting "gravity leveling." Furthermore, at column 1, lines 26-34, Kitaura discloses that casting and compression molding are alternatives and equivalents; therefore, it would have been obvious to substitute or combine the compression molding of Kitaura for or with the casting of Brooks. See In re May (CCPA) 136 USPQ 208 (It is our opinion that the substitution of Wille's type seal for the cement of Hallauer in Figure 1 would be obvious to persons of ordinary skill in the art from the disclosures of these references, merely involving an obvious selection between known alternatives in the art and the application of routine technical skills.); In re Cornish (CCPA) 125 USPO 413; In re Soucy (CCPA) 153 USPQ 816; Sabel et al. v. The Wickes Corporation et al. (DC SC) 175 USPQ 3; Ex parte Seiko Koko Kabushiki Kaisha Co. (BdPatApp&Int) 225 USPQ 1260; and Ex parte Rachlin (BdPatApp&Int) 151 USPQ 56. See also Smith v. Hayashi, 209 USPQ 754 (Bd. of Pat. Inter. 1980) (However, there was evidence that both phthalocyanine and selenium were known photoconductors in the art of electrophotography. "This, in our view, presents strong evidence of obviousness in substituting one for the other in an electrophotographic environment as a photoconductor." 209 USPQ at 759.). An express suggestion to substitute one equivalent component or process for another is not necessary to render such substitution obvious. In re Fout, 675 F.2d 297, 213 USPQ 532 (CCPA 1982). "It is prima facie

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obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose.... [T]he idea of combining them flows logically from their having been individually taught in the prior art." In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980) (citations omitted). See also In re Crockett, 279 F.2d 274, 126 USPQ 186 (CCPA 1960); Ex parte Quadranti, 25 USPQ2d 1071 (Bd. Pat. App. & Inter. 1992).

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Applicant's amendment and remarks filed 8-12-4 have been fully considered, are addressed in the rejection supra and further addressed infra, or have been adequately addressed in the prior record.

The declaration under 37 CFR 1.132 filed 8-12-4 is insufficient to overcome the rejections of claims 109, 111, 115, 119, 120, 129-131 and 133 as set forth in the last Office action because it refers only to the system described in the instant application and not to the individual claims of the application. Thus, there is no showing that the objective evidence of nonobviousness is commensurate in scope with the claims. See MPEP § 716. Furthermore, there is no explicit or otherwise discernable declaration in the declaration or elsewhere in the record of the purpose of the declaration.

In view of the foregoing, when all of the evidence is considered, the totality of the rebuttal evidence of nonobviousness fails to outweigh the evidence of obviousness.

Applicant asserts, "the physical properties of a compression-molded resin layer and a dispensing method, such as that disclosed by JP '046 as illustrated in Figs. 98A-D of Yasunaga et al., have already been set forth in the paper submitted with the response filed January 18, 2002 . . . The data contained in that paper is included in the attached declaration of Toshimi Kawahara."

This assertions is respectfully deemed unpersuasive because a dispensing method, such as that disclosed by JP '046, is not necessarily relied on in the rejection. Furthermore, applicant has merely submitted the paper and declaration without further elucidation, and it is not otherwise clear what alleged physical properties of a compression-molded resin layer and a dispensing method applicant is relying on the submissions to set forth. In addition, the declaration does not directly refer to the claimed invention or the applied prior art, nor does applicant sufficiently explain the relevance of the proffered evidence. It is maintained as noted in the Office action filed on 7-25-2, "applicant . . . cites 'Kawahara,' 'for facilitating understanding.' However, applicant merely cites Kawahara ["the paper" supra] without

further elucidation, and the manner in which Kawahara facilitates understanding cannot be determined."

Also, applicant alleges, "Kitaura et al. merely sets forth that a resin encapsulation is preformed [sic] using a thermosetting resin moldable material such as an epoxy resin composition, etc., by casting, compression molding, injection molding, transfer molding, etc. . . . It is respectfully submitted, however, that this disclosure does not state that the physical or structural properties are equivalents. Accordingly, Kitaura et al. fails to provide the teachings which Yasunaga et al. lacks, as discussed in detailed [sic] above."

This allegation is respectfully deemed unpersuasive because Kitaura is not necessarily relied on in the rejection for a statement that the physical or structural properties are equivalents. Instead, Kitaura is relied on for the disclosure that transfer molding and compression-molding processes are alternative and equivalent processes.

Applicant also states, "a compression-molded resin layer has different physical and structural properties as compared with a resin layer such as an encapsulation disclosed by Brooks et al."

This statement is respectfully deemed unpersuasive because it is unsupported by proof or a showing of facts; hence, it essentially amounts to mere conjecture. Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter.

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1989) (statement in publication dismissing the "preliminary identification of a human b - NGF - like molecule" in the prior art, even if considered to be an expert opinion, was inadequate to overcome the rejection based on that prior art because there was no factual evidence supporting the statement); In re Beattie, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992) (declarations of seven persons skilled in the art offering opinion evidence praising the merits of the claimed invention were found to have little value because of a lack of factual support); Ex parte George, 21 USPQ2d 1058 (Bd. Pat. App. & Inter. 1991) (conclusory statements that results were "unexpected," unsupported by objective factual evidence, were considered but were not found to be of substantial evidentiary value).

To this end, applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

In response to this requirement, please explicitly state the different physical and structural properties that a compression-molded resin layer has as compared with the resin layer disclosed by Brooks, and provide factual evidence for this statement.

Applicant is reminded that the reply to this requirement must be made with candor and good faith under 37 CFR 1.56. Where applicant does not

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have or cannot readily obtain an item of required information, a statement that the item is unknown or cannot be readily obtained will be accepted as a complete reply to the requirement for that item.

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

For information on the status of this application applicant should check PAIR: Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alternatively, applicant may contact the File Information Unit at (703) 308-2733. Telephone status inquiries should not be directed to the examiner. See MPEP 1730VIC, MPEP 203.08 and MPEP 102.

Any other telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (571) 272-1930. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is (703) 872-9306.

David E. Graybill Primary Examiner

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D.G. 26-Nov-04